

Shinest Apparels Ltd

Azim Tower, Plot No. 217/1, Beribadh, Mohammadpur, Dhaka, Bangladesh
(23.768754N, 90.345978E)
24 May 2014

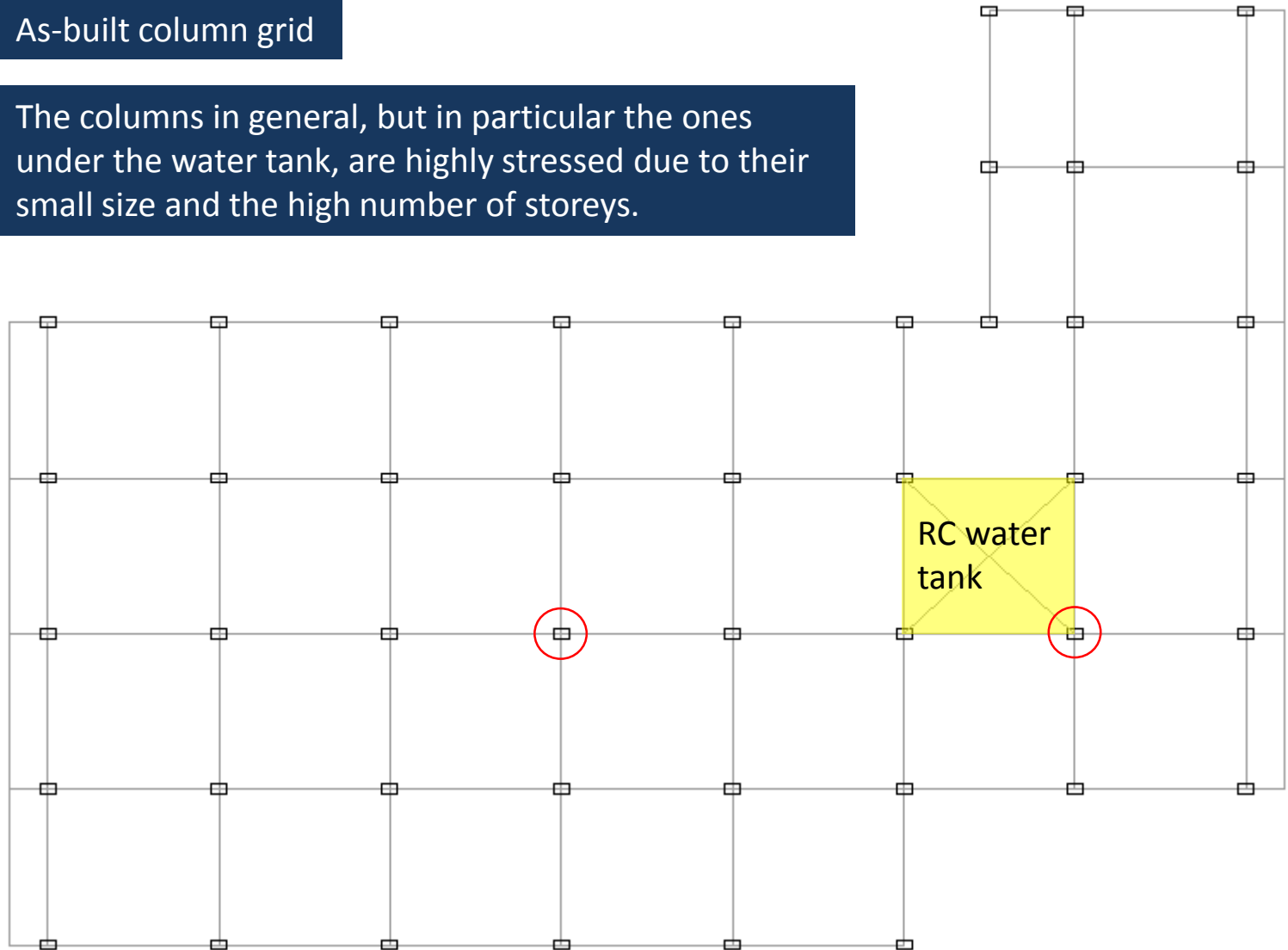


Observations

Small column sizes leading to high column stresses

As-built column grid

The columns in general, but in particular the ones under the water tank, are highly stressed due to their small size and the high number of storeys.



High punching shear stresses in some areas of the flat slabs



SLAB THICKNESS = 7"
A. 12 mm dia 5"o/c at alt ckd.
B. 12 mm dia 7"o/c at alt ckd.
Use 2- 10 mm dia Ext. Top betn ckd (shown in sketch)

SLAB THICKNESS = 5"
A. 10 mm dia 5"o/c at alt ckd.
B. 10 mm dia 7"o/c at alt ckd.
Use 2- 10 mm dia Ext. Top betn ckd (shown in sketch)

The reinforcement drawings are inconsistent regarding slab thickness and reinforcement quantities.

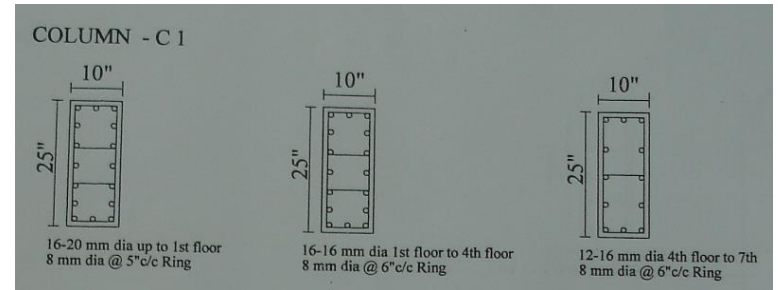
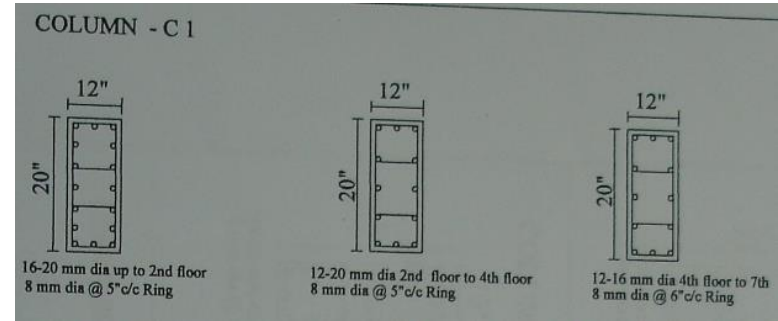
The punching shear stress is high for some columns, e.g. 1st internal combined with small column size based on a slab thickness of 7".
With a slab thickness of only 5", the punching shear stresses would be high for all columns.

The column sizes vary in the different storeys (e.g. 495 x 300mm on 7th floor, 650 x 320mm on 1st floor).

Discrepancies between observed and documented column reinforcement



Scanned column reinforcement



There are discrepancies in the reinforcement drawings for the columns regarding size and reinforcement amount.

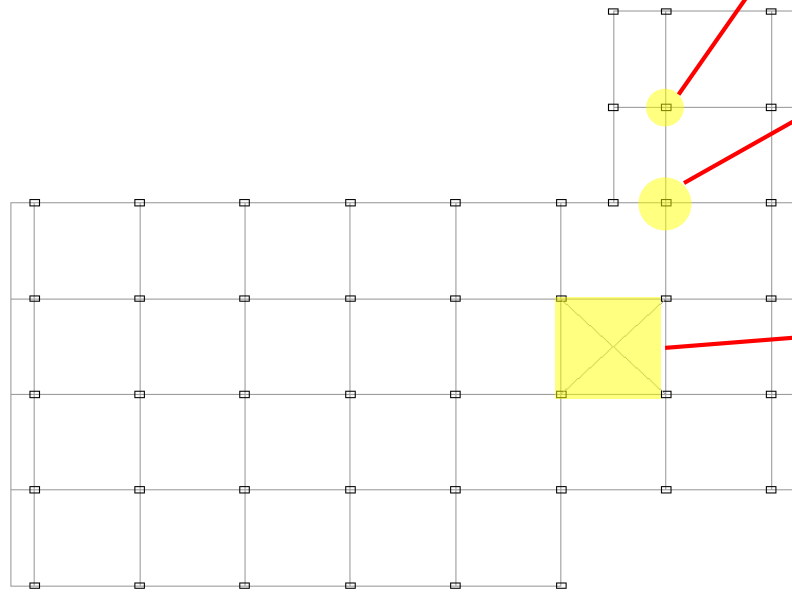
A typical column should have 3 bars on its short side and 7 bars on the long side. Several columns were checked and the number of bars on the long side seem to deviate from the drawings.

High storage load in localised areas



Basement

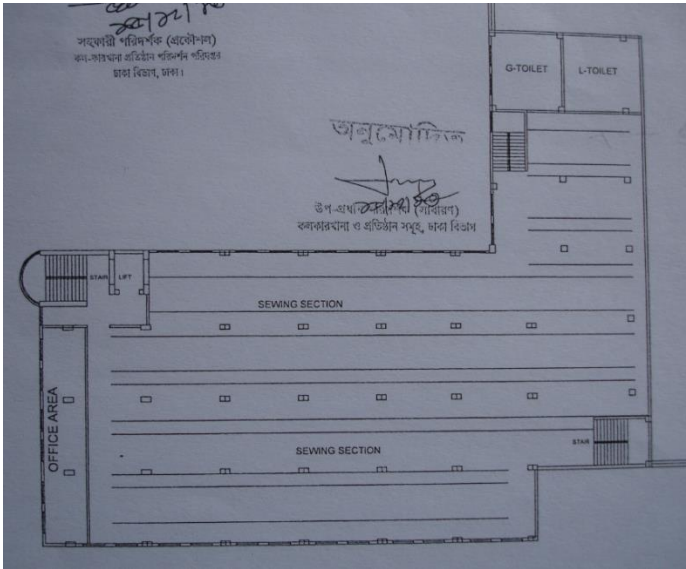




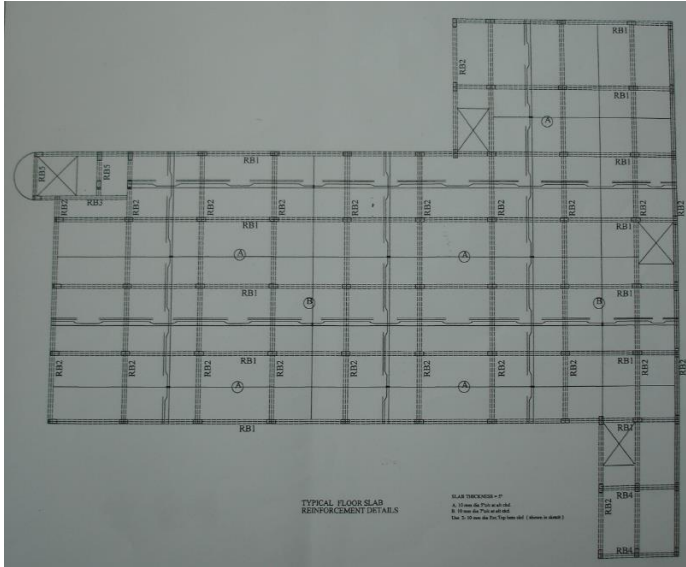
Roof

High storage load in localised areas

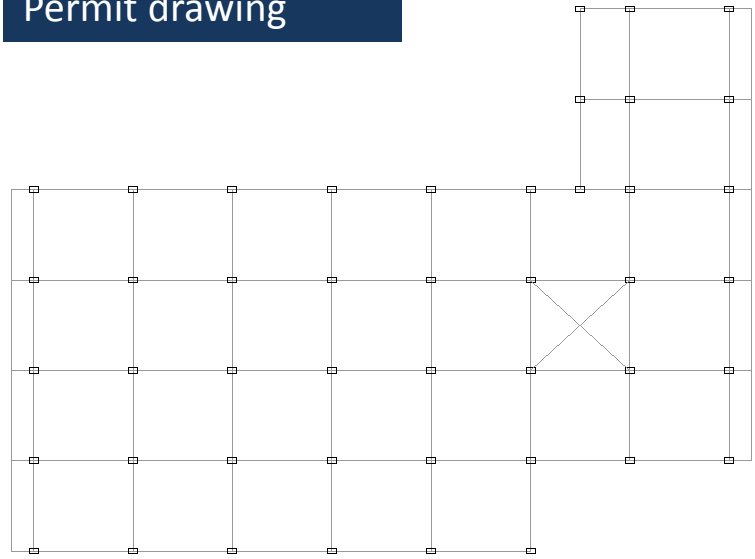
Inconsistencies in documentation / building permit



Permit drawing



Structural drawing



As-built layout

The permit drawings are inconsistent with the structural drawings.

The as-built structure deviates from both in some areas.

Priority Actions

Problems Observed

1. Small column sizes leading to high column stresses
2. High punching shear stresses in some areas of the flat slabs
3. Discrepancies between observations and documentation
4. High storage load in localised areas

Item No.	Observation	Recommended Action Plan	Recommended Timeline
1	Small column sizes leading to high column stresses	Release all water from RC water tank on the roof and restrict loads to 1.0kN/m ² on the roof, to 1.5kN/m ² in 8th to 1st floor and to 2.0kN/m ² in ground floor, pending the outcome of the Detail Engineering Assessment.	Immediate - Now
2	Small column sizes leading to high column stresses	Building Engineer to review design, loads and columns stresses in all columns.	Immediate - Now
3	Small column sizes leading to high column stresses	Verify insitu concrete stresses either by 100mm diameter cores or existing cylinder strength data for a minimum of 4 columns.	Immediate - Now
4	Small column sizes leading to high column stresses	A Detail Engineering Assessment of the building to be carried out immediately, see attached scope.	Immediate - Now
5	Small column sizes leading to high column stresses	Produce and actively manage a loading plan for all floor plates within the building, giving consideration to floor capacity and column capacity.	6-weeks
6	Small column sizes leading to high column stresses	Detail Engineering Assessment to be completed.	6-weeks
7	Small column sizes leading to high column stresses	Continue to implement load plan.	6-months

Detail Engineering Assessment

This Schedule develops a minimum level of information, Analysis and testing expected as part of a Detail Engineering Assessment.

The Building(s) have been visually assessed and it is deemed necessary that a detailed engineering assessment be carried out by a competent Engineering Team employed by the factory Owner.

This Request should be read in conjunction with the BUET developed Tripartite Guideline document for Assessment of Structural Integrity of Existing RMG Factory Buildings in Bangladesh (Tripartite Document), the latest version of this document should be referenced. This document also gives guidance on required competency of Engineering Team.

We expect that the following will be carried out:

1. Development of Full Engineering As-Built Drawings showing Structure, loading, elements, dimensions , levels, foundations and framing on Plan, Section and Elevational drawings .
2. The Engineering team are to carry out supporting calculations with a model based design check to assess the safety and serviceability of the building against loading as set out in BNBC-2006, Lower rate provisions can be applied in accordance with the Tripartite Guidelines following international engineering practice, justification for these lower rate provisions must be made.
3. A geotechnical Report describing ground conditions and commenting on foundation systems used/proposed.
4. A report on Engineering tests carried out to justify material strengths and reinforcement content in all key elements studied.
5. Detailed load plans shall be prepared for each level showing current and potential future loading with all key equipment items shown with associated loads.
6. The Engineering team will prepare an assessment report that covers the following:
 - As-Built drawings including
 - Plans at each level calling up and dimensioning all structural components
 - Cross sectional drawings showing structural beams, slabs, floor to floor heights, roof build-ups and Basic design information of the structure
 - Highlight any variation between As-built compared to the designed structure
 - Results of testing for strength and materials
 - Results of geotechnical assessment and testing/investigation
 - Details of loading, inputs and results of computer modelling
 - Commentary on adequacy/inadequacy of elements of the structure
 - Schedule of any required retrofitting required for safety or performance of Structure

Any proposals for Retrofitting to follow guidance developed in the Tripartite Document

Item No.	Observation	Recommended Action Plan	Recommended Timeline
8	High punching shear stresses in some areas of the flat slabs	As part of the Detail Engineering Assessment (see Item 1), verify in-situ concrete strength of slabs either by 100mm diameter cores (remote from columns) or existing cylinder strength data.	Immediate - Now
9	High punching shear stresses in some areas of the flat slabs	Verify existing top reinforcement of slabs.	Immediate - Now
10	High punching shear stresses in some areas of the flat slabs	Review of design, loads and column stresses in flat slabs to be completed.	6-weeks
11	High punching shear stresses in some areas of the flat slabs	Output from review to be incorporated in load plan (see Item 1).	6-weeks
12	High punching shear stresses in some areas of the flat slabs	Continue to implement load plan.	6-months

Item No.	Observation	Recommended Action Plan	Recommended Timeline
13	Discrepancies between observations and documentation	As part of Detail Engineering Assessment (see Item 1), Building engineer to verify the column and flat slab reinforcement as constructed.	Immediate - Now
14	Discrepancies between observations and documentation	Building Engineer to survey building.	Immediate - Now
15	Discrepancies between observations and documentation	Drawings and documentation to be updated as required to reflect as-constructed details.	6-weeks
16	High storage load in localised areas	Limit storage load as required in accordance with loading plan (see Item 1).	6-weeks
17	High storage load in localised areas	Continue to implement load plan.	6-months